

Application Number 09/900,514
Responsive to Office Action mailed February 8, 2005

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): An apparatus comprising:
a set of input ports to receive data packets for a plurality of priority levels;
a set of sink ports coupled to said set of input ports to receive and forward said data packets; and
a set of data rings coupling said set of input ports and said set of sink ports,
wherein at least one of the sink ports includes a bandwidth allocation circuit that calculates a weighted average bandwidth for each of the priority levels and rejects packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for at least two of the priority levels exceeds a predetermined value.

Claim 2 (Original): The apparatus of claim 1, wherein said set of data rings couples each sink port in said set of sink ports to each input port in said set of input ports.

Claim 3 (Original): The apparatus of claim 1, wherein said set of data rings is a single ring.

Claim 4 (Original): The apparatus of claim 1, wherein said set of data rings includes three rings.

Claim 5 (Original): The apparatus of claim 1, wherein each sink port in said set of sink ports snoops data packets on each data ring in said set of data rings.

Claim 6 (Original): The apparatus of claim 1, wherein a first sink port in said set of sink ports snoops data packets on each data ring in said set of data rings to determine whether said data packets are destined for said first sink port.

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Claim 7 (Original): The apparatus of claim 6, wherein said first sink port snoops each of said data packets to determine whether said each of said data packets contains a destination address supported by said first sink port.

Claim 8 (Original): The apparatus of claim 1, wherein a first set of input ports in said set of input ports is coupled to a first data ring in said set of data rings and a second set of input ports in said set of input ports is coupled to a second data ring in said set of data rings.

Claim 9 (Original): The apparatus of claim 1, wherein a first sink port in said set of sink ports snoops data packets on each data ring in said set of data rings and determines whether to accept a data packet based on a set of criteria.

Claim 10 (Original): The apparatus of claim 9, wherein said set of criteria includes said sink port having sufficient storage space for storing said data packet.

Claim 11 (Original): The apparatus of claim 10, wherein said set of criteria includes said sink port supporting a destination targeted by said data packet.

Claim 12 (Original): The apparatus of claim 11, wherein said set of criteria includes a total number of packets being received by said first sink port not exceeding a predetermined number of packets.

Claim 13 (Original): The apparatus of claim 1, wherein a sink port in said set of sink ports includes:

- a ring interface coupled to said set of data rings to receive data from said data packets;
- a storage buffer coupled to said ring interface to receive and store said data; and
- an output port coupled to said storage buffer to receive said data from said storage buffer and transmittal said data on a communications link.

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Claim 14 (Original): The apparatus of claim 1, wherein an input port in said set of input ports includes:

a communications interface to receive said data packets from a communications link; and
a storage buffer coupled to said communications link to store data from said data packets,
said storage buffer coupled to at least one data ring in said set of data rings.

Claim 15 (Currently Amended): A cross-bar switch comprising:

a set of input ports to receive data packets from a communications link for a plurality of priority levels;

a set of sink ports coupled to said set of input ports to receive said data packets from said set of input ports; and

a set of data rings coupling each sink port in said set of sink ports to each input port in said set of input ports,

wherein at least one of the sink ports includes a bandwidth allocation circuit that calculates a weighted average bandwidth for each of the priority levels and rejects packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for a different one of the priority levels exceeds a predetermined value.

Claim 16 (Original): The cross-bar switch of claim 15, wherein each sink port in said set of sink ports snoops data packets on each data ring in said set of data rings.

Claim 17 (Original): The cross-bar switch of claim 15, wherein a first sink port in said set of sink ports snoops data packets on each data ring in said set of data rings to determine whether said data packets are destined for said first sink port.

Claim 18 (Original): The cross-bar switch of claim 17, wherein said first sink port snoops each of said data packets to determine whether said each of said data packets contains a destination address supported by said first sink port.

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Claim 19 (Original): The cross-bar switch of claim 15, wherein a first set of input ports in said set of input ports is coupled to a first data ring in said set of data rings and a second set of input ports in said set of input ports is coupled to a second data ring in said set of data rings.

Claim 20 (Original): The cross-bar switch of claim 15, wherein a sink port in said set of sink ports includes:

- a ring interface coupled to said set of data rings to receive data from said data packets;
- a storage buffer coupled to said ring interface to receive and store said data; and
- an output port coupled to said storage buffer to receive said data from said storage buffer and transmit said data on a communications link.

Claim 21 (Original): The cross-bar switch of claim 15, wherein an input port in said set of input ports includes:

- a communications interface to receive data packets from a communications link; and
- a storage buffer coupled to said communications link to store data from said data packets, said storage buffer coupled to at least one data ring in said set of data rings.

Claim 22 (Currently Amended): A[[n]] cross-bar switch comprising:

- a set of input ports to receive data packets from a communications link for a plurality of priority levels;

- a set of sink ports coupled to said set of input ports to receive said data packets from said set of input ports; and

- a set of data rings coupling each sink port in said set of sink ports to each input port in said set of input ports, wherein each sink port in said set of sink ports snoops data packets on each data ring in said set of data rings,

- wherein at least one of the sink ports includes a bandwidth allocation circuit that calculates a weighted average bandwidth for each of the priority levels and rejects packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for a different one of the priority levels exceeds a predetermined value.

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Claim 23 (Original): The cross-bar switch of claim 22, wherein a first set of input ports in said set of input ports is coupled to a first data ring in said set of data rings and a second set of input ports in said set of input ports is coupled to a second data ring in said set of data rings.

Claim 24 (Original): The cross-bar switch of claim 22, wherein a sink port in said set of sink ports includes:

a ring interface coupled to said set of data rings to receive data from said data packets;
a storage buffer coupled to said ring interface to receive and store said data; and
an output port coupled to said storage buffer to receive said data from said storage buffer and transmit said data on a communications link

Claim 25 (Currently Amended): A method for transferring data packets to targets, said method comprising the steps of:

- (a) receiving a set of data packets for a plurality of priority levels;
- (b) transferring said set of data packets to a set of data rings, wherein a set of sink ports is coupled to said set of data rings;
- (c) a sink port in said set of sink ports, ~~determining whether to accept data packets in said set of data packets, based on a set of criteria~~ calculating a weighted average bandwidth for each of the priority levels and rejecting packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for a different one of the priority levels exceeds a predetermined value; and
- (d) said sink port, collecting data for data packets accepted by said sink port.

Claim 26 (Original): The method of claim 25, wherein said step (c) and said step (d) are performed by each sink port in said set of sink ports.

Claim 27 (Original): The method of claim 25, wherein said step (c) includes the step of:

- (1) said sink port, determining whether a data packet includes a destination address in a predetermined set of destination addresses.

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Claim 28 (Currently Amended): The method of claim 27, wherein said step (c) includes the step of:

(2) said sink port, determining whether to accept said data packet based on additional criteria ~~in said set of criteria~~.

Claim 29 (Original): The method of claim 28, wherein said step (c)(2) includes the step of:

(i) determining whether said sink port is enabled to receive data packets.

Claim 30 (Original): The method of claim 29, wherein said step (c)(2) includes the step of:

(ii) determining whether said sink port has sufficient resources to store said data packet.

Claim 31 (Original): The method of claim 30, wherein said step (c)(2) includes the step of:

(iii) determining whether said sink port is currently receiving a maximum allowable number of packets.

Claim 32 (Original): The method of claim 31, wherein said step (c)(2) includes the step of:

(iv) determining whether said packet has a number of bytes within a predetermined range.

Claim 33 (Original): The method of claim 28, further including the step of:

(e) said sink port, issuing a rejection signal if said sink port determines not to accept said data packet in said step (2).

Claim 34 (Original): The method of claim 33, wherein said rejection signal terminates further reception of said data packet by said sink port.

Claim 35 (Original): The method of claim 25, further including the step of:

(f) said sink port transmitting said data packets collected in said step (d).

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Claim 36 (Currently Amended): An apparatus for transferring data packets to targets, said apparatus comprising:

receiving means for receiving a set of data packets;

a set of sink ports coupled to said receiving means to receive said set of data packets from said receiving means, each sink port in said set of sink ports including:

(i) determining means for determining a weighted average bandwidth for each of a plurality of priority levels and rejecting packet data when the weighted average bandwidth for at least two of the priority levels exceeds a predetermined value
~~determining whether to accept data packets in said set of data packet, based on a set of~~
criteria; and

(ii) storage means for storing data for packets accepted by said sink port; and
data ring means for coupling said receiving means to said set of sink ports.

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Claim 37 (Currently Amended): A cross-bar switch comprising:

a set of input ports to receive data packets from a communications link;

a set of sink ports coupled to said set of input ports to receive said data packets from said set of input ports, wherein each sink port in said set of sink ports includes:

(i) a ring interface coupled to said set of data rings to receive data from said data packets,

(ii) a bandwidth allocation circuit that calculates a weighted average bandwidth for each of a plurality of priority levels and rejects packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for a different one of the priority levels exceeds a predetermined value.

(iii) a storage buffer coupled to said ring interface to receive and store said data, and

(iv) an output port coupled to said storage buffer to receive said data from said storage buffer and transmit said data on a communications link; and
a set of data rings coupling each sink port in said set of sink ports to each input port in said set of input ports,

wherein each sink port in said set of sink ports snoops data packets on each data ring in said set of data rings.

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Claim 38 (Currently Amended): A method for transferring data packets to targets, said method comprising the steps of:

- (a) receiving a set of data packets;
- (b) transferring said set of data packets to a set of data rings, wherein a set of sink ports is coupled to said set of data rings;
- (c) a sink port in said set of sink ports, determining whether to accept data packets in said set of data packets, based on a set of criteria, wherein said step (c) includes the steps of:
 - (1) said sink port; determining whether a data packet includes a destination address in a predetermined set of destination addresses, and
 - (2) said sink port; calculating a weighted average bandwidth for each of a plurality of priority levels and rejecting packet data having a first priority level in said plurality of priority levels when the weighted average bandwidth for a different one of the priority levels exceeds a predetermined value~~determining whether to accept said data packet based on additional criteria in said set of criteria;~~
- (d) said sink port, collecting data for data packets accepted by said sink port;
- (e) said sink port, issuing a rejection signal if said sink port determines not to accept said data packet in said step (c)(2); and
- (f) said sink port transmitting said data packets collected in said step (d), wherein said step (c) and said step (d) are performed by each sink port in said set of sink ports.